

LISTING OF THE CLAIMS

Claims 1-18. (Canceled)

19. (Previously Presented) A speech decoding apparatus according to code-excited linear prediction, wherein the speech decoding apparatus receives a coded speech including a gain code and synthesizes a speech, the speech decoding apparatus comprising:

a gain decoder for receiving the gain code and for decoding a gain of a speech in a concerning decoding period based on the gain code input;

a noise level evaluator for evaluating a noise level of the speech in the concerning decoding period by using the gain decoded by the gain decoder;

an excitation codebook storing time series vectors; and

a noise level controller for changing a noise level of the time series vectors output from the excitation codebook based on an evaluation result of the noise level evaluator.

20. (Previously Presented) A speech decoding apparatus according to code-excited linear prediction, wherein the speech decoding apparatus receives a coded speech including a linear prediction parameter code, an adaptive code, an excitation code, and a gain code and synthesizes a speech, the speech decoding apparatus comprising:

an adaptive codebook, which stores an old excitation signal, for receiving the adaptive code and for outputting a time series vector corresponding to the old excitation signal based on the adaptive code input;

an excitation codebook, which stores a plurality of time series vectors corresponding to a plurality of predetermined excitation signals, for receiving the excitation code and for outputting a time series vector corresponding to an excitation signal based on the excitation code input;

a gain decoder for receiving the gain code and decoding a gain of a speech in a concerning decoding period from the gain code input;

a noise level evaluator for inputting the gain decoded by the gain decoder and for evaluating a noise level of the speech in the concerning decoding period by using the gain input;

a noise level controller for inputting an evaluation result of the noise level evaluator and the time series vector output from the excitation codebook and for changing a noise level of the time series vector output from the excitation codebook based on the evaluation result of the noise level evaluator;

a weighting-adder for inputting the time series vector output from the adaptive codebook and the time series vector output from the excitation codebook and the gain decoded by the gain decoder, for weighting the time series vector output from the adaptive codebook and the time series vector output from the excitation codebook by using the gain, for adding a time series vector weighted by using the gain and a time series vector weighted by using the gain, and for outputting an addition result;

a linear prediction parameter decoder for receiving the linear prediction parameter code and for decoding and outputting a linear prediction parameter from the linear prediction parameter code input; and

a synthesis filter for inputting the linear prediction parameter output from the linear prediction parameter decoder and the addition result output from the weighting-adder and for synthesizing the speech using the linear prediction parameter and the addition result.

21. (Previously Presented) A speech decoding method according to code-excited linear prediction, wherein the speech decoding method receives a coded speech including a gain code and synthesizes a speech, the speech decoding method comprising:

receiving the gain code and decoding a gain of a speech in a concerning decoding period from the gain code;

evaluating a noise level of the speech in the concerning decoding period by using the gain decoded; and

changing a noise level of time series vectors output from an excitation codebook based on an evaluation result.

22. (Previously Presented) A speech decoding method according to code-excited linear prediction for decoding a coded speech including a linear prediction parameter code, an adaptive code, an excitation code, and a gain code and synthesizing a speech, the speech decoding method comprising:

receiving the adaptive code to an adaptive codebook, which stores an old excitation signal, and outputting, from the adaptive codebook, a time series vector corresponding to the old excitation signal based on the adaptive code input;

receiving the excitation code to an excitation codebook and outputting, from the excitation codebook, a time series vector corresponding to an excitation signal based on the excitation code input;

receiving the gain code and decoding a gain of a speech in a concerning decoding period from the gain code input;

inputting the gain decoded and evaluating a noise level of the speech in the concerning decoding period by using the gain input;

inputting an evaluation result and time series vector output from the excitation codebook, and changing a noise level of the time series vector output from the excitation codebook based on the evaluation result;

inputting the time series vector output from the adaptive codebook and the time series vector output from the excitation codebook and the gain decoded, weighting the time series vector output from the adaptive codebook and the time series vector output from the excitation codebook by using the gain, adding a time series vector weighted by using the gain and a time series vector weighted by using the gain, and outputting an addition result,

receiving the linear prediction parameter code, and decoding and outputting a linear prediction parameter from the linear prediction parameter code input; and

inputting the linear prediction parameter output and the addition result output and synthesizing the speech using the linear prediction parameter and the addition result.

23. (New) A speech decoding method according to code-excited linear prediction (CELP) wherein the speech decoding method receives a speech code and synthesizes a speech using at least an excitation codebook, the speech decoding method comprising:

- obtaining a time series vector with a noise level from the excitation codebook;
- determining whether modification of the time series vector is necessary;
- if modification is determined to be necessary, modifying the time series vector such that the noise level is changed;
- outputting the time series vector; and
- synthesizing a speech using the outputted time series vector.

24. (New) A speech decoding apparatus according to code-excited linear prediction (CELP) wherein the speech decoding apparatus receives a speech code and synthesizes a speech using at least an excitation codebook, the speech decoding apparatus comprising:

- a time series vector modulator for obtaining a time series vector with a noise level from the excitation codebook and determining whether modification of the time series vector is necessary and or modifying the time series vector such that the noise level is changed if modification is determined to be necessary, and for outputting the time series vector; and
- a speech synthesizer for synthesizing a speech using the outputted time series vector.